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The importance of paleopathology is that it gives an opportunity of studying evidences of disease over a great period of time, and especially is this true in regard to the data offered by paleontology. That the study of these evidences may aid in the solutions of problems which are at present not solved is evident when we consider that many epidemics which sweep the world, such as the one just past, are doubtless the result of an accumulation of changes over a long period of time. It is well known in medical history how whole populations have been swept away by scourges, which, had the people understood them, could have been avoided, and in the future when we come to understand all of the events of past history we may be better prepared to avoid future conditions of a like nature.

A disadvantage under which the student of paleopathology works is that the results of epidemics are scarcely ever recorded especially in paleontological material. The presence of tsetse flies in the Oligocene of Colorado suggests the possibility of trypanosomiasis among the herds of artiodactyls and perissodactyls of the early Tertiary but it can be considered merely suggestive. The search for such evidences is, however, just begun, and we may in future learn more of the epidemics which, in the past, must have swept through the herds of early animals.

The careful description, illustration and study of ancient cases of fracture, of diseased bones or any evidences of pathology is extremely desirable and will advance the study of paleopathology. Evidences of disease may be detected in the positions assumed by animals at death, the opisthotonos, the pleurothotonos and related phenomena. It is a question open to discussion whether the opisthotonic attitude is a manifestation of disease, but it is as suggestive of neuro-toxic disturbances as may well be. Whether the position assumed by the fossilized skeleton is the same as the animal assumed at death, how much is due to shifting before fossilization, are matters of minor importance to the student of medical history who is chiefly impressed with the fact that a dinosaur preserved in the opisthotonic

attitude suggests to him the spasms seen in many recent diseases. The student of medical history is interested in a Mesozoic fracture because it extends his knowledge of traumatism, and if the study of the fracture is complete it adds to his knowledge of general pathology.

The relation of disease to extinction, and other more important relations, may be cleared to some extent by a study of paleontological material. The part disease has played in the evolution of forms, whether retarding, changing, or ending their development also attracts the attention of the student of paleopathology.

Medical history, like all other histories, is based on an accumulation of data from widely different fields, and it is the privilege of paleontologists to add to the great wealth already accumulated, more data as to what happened among the animals with which they are familiar, representing the inhabitants of the earth millions of years ago. The subject is worthy of more careful consideration than has been given it in the past. Paleopathology has attracted scant attention among paleontologists but eminent students such as Cuvier, Soemmering, Goldfuss, Schmerling, Leidy, Williston have found the subject of interest. It remained for the men who had been trained in pathology, men like von Walther, Mayer and Virchow, to show the exact relation of pathological lesions among extinct animals to the general problems of disease which are interesting men to-day.

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A RECENTLY DISCOVERED ART CAVERN IN FRANCE

UNDER the auspices of the French Académie des Inscriptions and over the signature of M. Ch. Dauzats, there appeared in *Le Figaro* of September 7 an interesting notice of another remarkable discovery of ancient cave paintings in southern France. A translation of the article follows:

These are the most ancient records of human art, as M. Salomon Reinach was remarking yesterday when congratulating Count Begouen who, with his three sons, has just

discovered the above records while exploring the prehistoric cavern at Montesqui-Avantes in Ariège.

The first finds of Count Begouen and his sons, which we mentioned when brought forth in 1914, before the war, were of great interest to the institute.

Some months later the three brothers departed for the front. What they have done there may be learned from the numerous and splendid citations which we have published. But that which they accomplished for science during their furloughs was not known. Yet it is of consequence that we learn and for that reason their father came yesterday to tell the academy that in June last during one of these furloughs which reunited all three sons at Montesqui-Avantes he continued with them the exploration of the Ariège cave.

This time Count Begouen and his sons discovered on the walls of the subterranean galleries some engravings estimated to be thirty thousand years old, and in such quantity and variety that the extraordinary ensemble of prehistoric art work constitutes a veritable museum.

The animals figured in the cave are considerable in number and include reindeers, bison, horses, both isolated and in groups; bears, elephants and rhinoceroses. The representations of felines are very rare in prehistoric art; but MM. Begouen have photographed in their cave a genuine lion, executed in bas-relief. They have made out also several birds including swans, ducks, as well as three predatory night fliers.

The human figure is likewise represented in the cave, which in recognition of the sons of Count Begouen has been baptized "the Cave of the Three Brothers." A silhouette is particularly remarkable, almost baffling. It represents a man in motion; a man of powerful body, whose head and shoulders are joined by an enormous neck; a man whose upper and lower limbs and whose hands and feet are perfectly human, but whose vertebral column is prolonged in an exterior appendage resembling that of the anthropoids; a man, at last, *qui marche à quatre pattes!*

The suggestions prompted by the magnificent discovery of MM. Begouen have long held the attention of the academy. MM. Dieulafoy, Salomon Reinach, Edmond Pottier, Langlois, Louis Leger, Bouché-Leclercq are particularly interested.

Several communications have been made on the subject by MM. Homolle and Clermont-Ganneau.

N. C. NELSON

SCIENTIFIC BOOKS

The Destinies of the Stars. By SVANTE ARRHENIUS. G. P. Putnam's Sons. 1918. Pp. xvii + 256, illustrated.

In 1903 Dr. Arrhenius was awarded the Noble Prize for his researches in the field of electro-chemistry. To the study of the development of the celestial universe, he, therefore, brings the mind of a trained chemist; the mind of one who is especially fitted to grapple with the intricate problems of the evolution of the stars and planets from the formless masses of gaseous nebulae.

In "The Destinies of the Stars" this evolution is traced through the spiral nebulae, the gaseous stars, the sun, the worlds to be, Jupiter and Saturn, the world, to the final destiny of all, the dead planets, Mercury and Mars. In this general theory of growth and decay there is, of course, little that is new, but Dr. Arrhenius treats the matter in a new way and brings out many new points.

The chapter devoted to the planet Mars is especially interesting. In this the so-long popular fantastic ideas of Lowell are scientifically and clearly discussed, and the utter impossibility of any life, such as we have any conception of, existing on Mars is conclusively shown. The inhabitants of this planet, the wonderful system of irrigating canals, the whole fabric of intensely interesting fact and fancy so cleverly woven by Lowell, are shown by the clear, concise reasoning of the chemist to be only "such stuff as dreams are made of."

The book is decidedly interesting and well worth careful reading. It lacks, however, continuity. This is due, undoubtedly, to the